

# New Onset of Inflammatory Arthritis Following Moderna COVID-19 Vaccination

Yu Rim Park BS and Ami Ben-Artzi MD

Division of Rheumatology, Cedars Sinai Medical Center, Los Angeles, CA, USA

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The expected side effects following an mRNA coronavirus disease 2019 (COVID-19) vaccine, as listed on U.S. Centers for Disease Control and Prevention website, can range from an injection site reaction to a more systemic reaction of fatigue, headache, muscle pain, chills, fever, and nausea. For patients with autoimmune and inflammatory rheumatic disease, the American College of Rheumatology reports a moderate consensus on a theoretical risk of a flare or disease worsening following COVID-19 vaccination [1].

A review of the literature showed a case series describing 17 cases of flares and 10 cases of new onset immune-mediated diseases following two doses of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccine. Among the 27 cases, 21 had at least one diagnosed autoimmune disease prior to vaccination. Out of the two cases that received the Moderna COVID-19 vaccine, one developed dactylitis of a finger and both had chilblains like lesions on fingers [2]. In addition, other autoimmune manifestations such as an event of immune thrombocytopenia following the Pfizer COVID-19 vaccine have been rarely described in literature [3]. In this case communication, we present two patients without history of autoimmune disease who developed dactylitis following the Moderna COVID-19 vac-

nation. We provide additional data on the rare potential adverse effect involving immune-mediated events.

## PATIENT DESCRIPTION

### PATIENT 1

A 73-year-old woman with a history of mild IgG deficiency complicated by bronchiectasis, osteoporosis, and cervical spine osteoarthritis presented with pain and swelling of her right second digit following COVID-19 vaccination. The patient presented with chronic back pain from multilevel lumbar spondylosis and no nail changes. She denied personal or family history of psoriasis, uveitis, or inflammatory bowel disease (IBD). She had no known history of COVID-19 infection, and was never been diagnosed with an inflammatory arthritis.

She received the first Moderna COVID-19 vaccine dose in her left arm in the morning, and by the evening she noticed swelling without pain of the left index finger that lasted for 2 days before resolving spontaneously. The morning after receiving the second dose in her left arm, she developed an injection site reaction of itchy erythematous rash spanning 12 cm across her arm, generalized fatigue, body aches, chills, nausea, and fever of 38.33°C. She took acetaminophen 625 mg and diphenhydramine every 6 hours throughout the day. The symptoms subsided after 3 days.

Nine days post-vaccination (of the second dose), patient developed right submandibular lymphadenopathy, which

also spontaneously resolved 6 days later. Nineteen days post-vaccination, patient presented with dactylitis of the right second digit with tenderness, warmth, and prominent swelling causing limited flexion of the finger, which developed 5 days prior to presentation [Figure 1A]. Ultrasound of the affected digit found subcutaneous edema that was strongly Doppler positive, small fluid around the flexor tendon, and absence of synovitis in the finger joints. Three weeks post-vaccination, the patient also developed a dry, scaly patch stretching 2 cm over the right ulnar styloid. She started applying 2.5% cortisone cream three times a day. The lesion started to improve, and she eventually discontinued the cream.

Laboratory sample collected 19 days post-vaccination resulted in normal complete blood count, normal complete metabolic panel, normal sedimentation rate and high-sensitivity C-reactive protein, and negative HLA-B27.

The following day, the patient was started on celecoxib 200 mg twice a day. On the fifth day of medication, she felt 80% improvement overall and was able to fully flex the proximal interphalangeal (PIP) joint and distal interphalangeal (DIP) joint. The patient discontinued celecoxib after 11 days.

By five and a half weeks following the second dose of the vaccine, the patient experienced 80–85% improvement in her symptoms from baseline. She was able to flex the finger fully and reported mild tenderness of the right PIP2 joint only with a mild swelling of the right index finger.

**Figure 1.** Inflammatory arthritis following Moderna COVID-19 vaccination



**[A]** Patient 1. Dactylitis of the right second digit seen on 25 February 2021



**[B]** Patient 2. Ultrasound of the left PIP2 displaying grade III synovitis

#### PATIENT 2

A 64-year-old man with a history of gastroesophageal reflux disease and hypertension presented with pain and swelling of his left second digit following COVID-19 vaccination. Patient denied back pains, nail changes, and personal or family history of psoriasis, uveitis, and IBD. He also did not have a known history of COVID-19 infection and had never been diagnosed with an inflammatory arthritis.

The patient received the first Moderna COVID-19 vaccine dose without unusual side effects. However, the day after receiving the second dose in his left arm, he developed a migraine, mild morning stiffness in his left PIPs 2–5, and severe pain, warmth, and swelling in the left PIP2. The patient began treating with naproxen 220 mg every 12 hours and topical cannabidiol. After 14 days, the pain level decreased to 4 out of 10. When the patient presented 5 weeks after the second dose of the vaccine, he was noted to have tenderness and swelling of PIP2 with limited flexion of the joint. The rest of the musculoskeletal exam was unremarkable. Diagnostic

ultrasound of the left second digit found grade III synovitis with grade II doppler signal in the dorsal aspect of the PIP2, and hypoechoic and enlarged A1 pulley in the volar aspect of the second metacarpophalangeal (MCP) joint [Figure 1B].

The patient was started on celecoxib 200 mg twice a day. Within 5 days, the patient reported 40% improvement in the pain and range of motion in the left PIP2. Two weeks after starting celecoxib, due to ongoing PIP 2 pain and swelling, he returned for an ultrasound-guided 20 mg methylprednisolone injection to the left PIP2 joint. By the following week, patient had 90% improvement in symptoms and discontinued celecoxib.

Environmental triggers have been reported for several types of autoimmune conditions including rheumatoid arthritis [4] and psoriatic arthritis [5]. In this report, we presented two cases of inflammatory arthritis and dermatitis, which appeared similar to psoriatic arthritis and psoriasis and were triggered by the Moderna COVID-19 vaccine. The medical community should be aware of the possibility of this rare adverse event associated with the vaccine.

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#### Correspondence

**Ms. Y. Rim Park**  
Division of Rheumatology, Cedars Sinai Medical Center, Los Angeles, CA 90048, USA  
**Phone:** (1-714) 512-0019  
**email:** yulimi07@gmail.com

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**No one is useless in this world who lightens the burden of it for anyone else.**

Charles Dickens (1812–1870), English writer and social critic of the Victorian era